Claims:

1. A material film production method, characterized in that the method comprises:

generating plasma including implantation target ions;

applying a control voltage to an electric potential body in contact with said plasma to thereby control a density of said implantation target ions;

irradiating said plasma toward a deposition-assistance substrate;

applying a bias voltage of a polarity opposite to that of said implantation target ions to said deposition-assistance substrate, to thereby provide said implantation target ions with acceleration energies, respectively; and

implanting said implantation target ions into a material film.

2. The material film production method of claim 1, characterized in that the method further comprises:

measuring an electric current flowing between said deposition-assistance substrate and a bias power supply for applying said bias voltage thereto, to thereby measure the density of said implantation target ions.

3. A material film production method, characterized in that the method comprises:

generating plasma including containment target ions and collision ions having the same polarity as said containment target ions;

irradiating said plasma toward a deposition-

assistance substrate;

applying a bias voltage of a polarity opposite to that of said containment target ions to said deposition-assistance substrate, to thereby provide said containment target ions and said collision ions with acceleration energies, respectively; and

colliding said collision ions with material molecules constituting a material film, to thereby cause said material molecules to internally contain said containment target ions, respectively.

4. The material film production apparatus of any one of claims 1 through 3, characterized in that the method further comprises:

depositing said material film on said deposition-assistance substrate, simultaneously with the irradiation of said plasma toward said deposition-assistance substrate.

5. The material film production method of any one of claims 1 through 3, characterized in that the method further comprises:

irradiating said plasma onto said material film previously deposited on said deposition-assistance substrate.

6. A material film production method, characterized in that the method comprises:

generating plasma including collision ions;

irradiating said plasma toward a material film previously deposited on said deposition-assistance

substrate;

simultaneously therewith, shooting vapor comprising containment target molecules toward said material film;

colliding said collision ions with material molecules constituting the material film; and

simultaneously therewith, causing said material molecules to internally contain said containment target molecules, respectively.

7. The material film production method of any one of claims 1 through 6, characterized in that the method further comprises:

transporting said generated plasma by a magnetic field to thereby irradiate said plasma toward said deposition-assistance substrate.

8. The material film production method of any one of claims 1 through 7, characterized in that said material film is a film comprising fullerene or nanotube.

9. The material film production method of any one of claims 1 through 5, 7, and 8, characterized in that said implantation target ions or said containment target ions are alkali metal ions, nitrogen ions, or halogen ions.

10. The material film production method of any one of claims 6 through 8, characterized in that said containment target substance is TTF, TDAE, TMTSF, pentacene, tetracene, anthracene, TCNQ, Alq_3, or F_4TCNQ.

11. The material film production method of any one of claims 3 through 10, characterized in that said collision

ions each have a diameter of 3.0□ or larger.

12. The material film production method of claim 11, characterized in that said collision ions are fullerene positive ions or fullerene negative ions, respectively.

13. A material film production apparatus comprising:

a vacuum vessel;

magnetic field generation means;

plasma generation means for generating plasma including implantation target ions;

an electric potential body configured to control a density of said implantation target ions by applying a control voltage to said electric potential body;

a deposition-assistance substrate for depositing a material film thereon; and

a bias power supply configured to apply a bias voltage to said deposition-assistance substrate.

14. The material film production apparatus of claim 13, characterized in that said electric potential body comprises electroconductive wires in a lattice pattern.

15. A material film production apparatus comprising:

a vacuum vessel;

magnetic field generation means;

plasma generation means for generating plasma including containment target ions;

collision ion generation means for generating collision ions;

a deposition-assistance substrate for depositing a

material film thereon; and

a bias power supply configured to apply a bias voltage to said deposition-assistance substrate.

16. A material film production apparatus comprising:

a vacuum vessel;

magnetic field generation means;

plasma generation means for generating plasma including collision ions;

a deposition-assistance substrate for depositing a material film thereon;

containment target molecule shooting means for shooting vapor including containment target molecules to said deposition-assistance substrate; and

a bias power supply configured to apply a bias voltage to said deposition-assistance substrate.